

REMARKS

Claims 1-2, 4-7 and 10-12 are pending in the above-identified application with claim 1 being withdrawn from consideration, claims 11-12 standing allowed and claims 2, 4-7 and 10 standing rejected.

Claim Rejections Under 35 USC § 103

Claims 2 and 6 are rejected under 35 USC § 103(a) as being unpatentable over Inoue et al. (US 5,468,344) in view of Hayakawa et al. (US 5,254,171). Claims 4 and 10 are also rejected under 35 USC § 103(a) as being unpatentable over Inoue US '344 in view of Hayakawa et al. US '171, further in view of Macdonald et al. (US 6,494,960). Likewise, claim 5 has been rejected under 35 USC § 103(a) as being unpatentable over Inoue et al. US '344 in view of Hayakawa et al. US '171, further in view of Gorczyca et al. (US 6,368,410). Finally, claim 7 has been rejected as being unpatentable under 35 USC § 103(a) over Inoue et al. US '344 in view of Gorczyca et al. US '410. Reconsideration and withdrawal of each of these rejections are respectfully requested based upon the following considerations.

The Present Invention and Its Advantages

The present invention relates to a surface process method and cleaning method for preventing generation of contaminates. As

recited in instant claim 2, the claimed invention entails the following:

2. (Previously Presented) A surface processing method comprising the steps of:

masking a portion of a susceptor (1) forming contact with a substrate (4),

applying a blasting process on said surface of a susceptor (1) that has SiO_2 as a main component, and etching the surface of said susceptor; and

wherein said susceptor includes:

a susceptor main body (2), and

a stepped portion (3) provided on said susceptor main body (2) to support said substrate (4) from the bottom, having a size smaller than said substrate (4), said stepped portion (3) being masked in said masking step.

According to the present invention, provision of a stepped portion at the surface of the susceptor allows overdischarge to be prevented. The application of blasting and etching ensures the adherence to withstand the layered film effectively, as well as to reduce particles such as glass particles from the blind scratch.

The masking treatment during the blasting process allows reduction of scratches at the bottom plane of the substrate and transportation error by preventing increase of the coefficient friction at the substrate contact surface. By carrying out rinsing with high pressure at the same time, reduction of the amount due to shorter etching time can be achieved.

The usage of a susceptor according to the present invention allows extension of the O·H cycle corresponding to the rate-determined film peeling, improvement of the ratio of acceptable

products, and reduction of the cost by improvement of the operating ratio of the apparatus.

Distinctions Over the Cited Art

Independent Claims 2 and 7

The Examiner recognizes the claw 133 shown in Figure 2 of the Inoue reference as a portion corresponding to the stepped portion (3) in claim 1, but in reality they are different from each other.

Applicants submit that the claw 133 is merely a hook portion to claw the clamp 132 shown in Figure 2 that the Examiner recognizes as a portion corresponding to the main body (2) recited in claim 2a, and can not attain the effect described in the instant specification from page 5, line 32, to page 6, line 3:

The wording "a size smaller than" implies that the dimension m and n of the stepped portion are set so that a film is not adhered on the bottom plane of the susceptor during film deposition of the substrate and also set so as to prevent warping of the substrate caused by stress to result in contact between the substrate and the surface during film deposition.

If, however, the USPTO still contends that the claw 133 has a function similar to that of the stepped portion (3), then the Examiner's attention is directed to Figures 1 and 2 of the Inoue reference, wherein the masking layer 122 is not provided between the stepped portion 133 and the substrate 131, but is instead provided beneath Si chip 121.

Accordingly, Applicants submit that the masking layer 122 of the Inoue reference is different from the masking layer of susceptor (1) forming contact with the substrate (4), which is recited in claim 2, lines 3-4, and can not attain the effect described in the specification from page 7, line 27, to page 8, line 10 and page 9, lines 17-22:

According to the structure of such an apparatus, the substrate, when raised upright, moves to the position supported by the susceptor pin through its own weight. If the portion of the susceptor forming contact with the substrate such as stepped portion 3 of Figure 1 is subjected to blasting, the coefficient of friction at the portion of the susceptor forming contact with the substrate will increase to result in variation in the self-weight drop of the substrate located on the susceptor. The timing of forming contact with the susceptor pin may be deviated to induce the problem of the substrate being misplaced leftwards or rightwards. Since the position where the substrate falls evenly in the horizontal direction by its own weight, viewed from the apparatus side, is taken as the teaching point by the robot, there is a possibility of erroneous transportation, occurrence of cracking in the substrate, or the like.

Therefore, by applying a mask at the portion in contact with the substrate in the blasting step of the susceptor to avoid increase in the coefficient of friction, the occurrence of scratching towards the bottom plane of the substrate and misalignment during transportation can be prevented.

Thus, a susceptor can be produced that has the two features, i.e., a plane that serves to enhance the adherence to prevent film peeling (for example, main unit 2 of Figure 2) and a plane prevented in the increase of the coefficient of friction to suppress erroneous transportation (for example, stepped portion 3 of Figure 2). Therefore, this method is extremely advantageous.

In addition to the above, it is noted that the blasting process on the susceptor (1) of claim 1 is not disclosed in the

Inoue reference. Although one can find the term "blasted" in the description on the third column, lines 29 through 30 of the Inoue reference, as can be seen from the description, the "blasted" step of the Inoue reference is obviously different from the blasting process of the present invention, which is applied on the surface of the susceptor (1).

Dependent Claims 4 and 10

The rinsing step of the Macdonald reference is conducted using a chemical process, but the rinsing step of each of claims 4 and 10 is conducted using a high pressure rinsing process as an example of physical processes. Therefore, it is submitted that each of claims 4 and 10 is distinguishable from the combination of the three references.

Dependent Claim 5

The feature of claim 5 is to reduce the possible damage of a surface of susceptor (1) by applying a blast process on a surface of a susceptor (1) using particles made of the same substance as that forming the susceptor (1) as blasting particles. The Gorczyca reference discloses quartz as a substance forming support 8, corresponding to the substrate (4) of claim 1, but the reference

does not disclose the use of quartz particles as blasting particles.

Accordingly, based upon the above considerations, it is submitted that each of the pending rejected claims (claims 2, 4-7 and 10) are allowable over the cited art of record. In this respect, the cited art provides no motivations, teachings or disclosures that would allow one of ordinary skill in the art to arrive at the present invention as claimed. Absent such teachings and motivations in the cited art, the references cannot form a proper basis for sustaining an obviousness rejection of the present claims.

Allowable Subject Matter

The Applicants appreciate the Examiner's courtesy in indicating that claims 11-12 contain allowable subject matter.

CONCLUSION

Based upon the remarks presented herein, the Examiner is now requested to issue a Notice of Allowance clearly indicating that each of pending claims 2, 4-7 and 10-12 are allowable.

Should there be any outstanding matters that need to be resolved in the present application, the Examiner is respectfully requested to contact John W. Bailey (Reg. No. 32,881) at the

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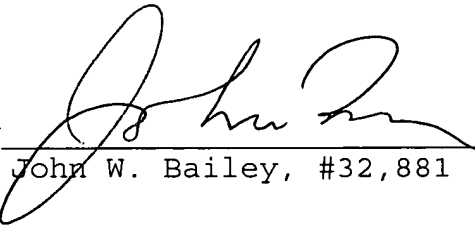
telephone number below, to conduct an interview in an effort to expedite prosecution in connection with the present application.

If necessary, the Commissioner is hereby authorized in this, concurrent, and future replies, to charge payment or credit any overpayment to Deposit Account No. 02-2448 for any additional fees required under 37 C.F.R. §§ 1.16 or 1.17; particularly, extension of time fees.

Respectfully submitted,

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By



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